Achieving the best recovery results with the Agilent 1100 Series dual-loop autosampler PS

Quick Reference Guide

CAUTION Important Information!

Please read before using the instrument!

Introduction

The injection principle of the dual-loop autosampler PS is different to that of other Agilent 1100 Series autosamplers. It is a fixed-loop push-through design as shown in Figure 1. Since the sample has to be drawn into a buffer loop and then transferred into the injection loop several items have to be considered to achieve best recovery results.

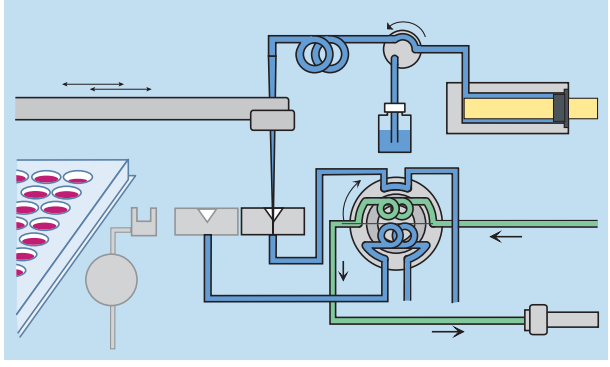

Figure 1 Injection principle dual-loop autosampler

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Rinse solvent

- The rinse solvent is used to rinse the injection port, the seat capillary and the injection valve after sample injection.
- To avoid precipitation problems, use a solvent in which the sample is readily soluble. For reversed-phase chromatography this could be acetonitrile, methanol or DMSO/acetonitrile 50:50 v/v, for example (pure DMSO is not recommended due to its high viscosity, see "Sample draw and eject speed").
- We strongly recommend to use the Rinse function subsequently to each injection. The rinse volume, which is calculated from the injection volume and a user-defined factor, should be at least 300 µL.
- The syringe should be purged at least 5 times using the *Purge Syringe* command from the *Instrument/More Injector* menu prior to the first run of a sequence.

Flush solvent

The flush solvent is used to flush the needle's exterior prior to the injection of the sample. Therefore a solvent should be used, in which the sample is readily soluble. For a list of solvents compatible with the tubing of the peristaltic pump see Table 1 below.

Table 1 Solvents compatible with tubings

Solvent	PharMed	Silicone †
Acetic acid > 5%	A	B
Acetone	D	D
Acetonitrile	A	-
Hexane, Heptane	C	-
NH4 acetate	C	-
Ethanol	C	B
Formic acid	A	C
MeOH	D	A
Propanol	C	A
Trichloroacetic acid	D	D
Water	A	A

A Fully compatible

B Minor reaction, e.g. slight corrosion or discoloration

C Not recommended for continuous use. Swelling/shrinkage, loss of strength.

D Severe reaction, not recommended for use

* Pre-installed

† Can be ordered (5042-8507)

Sample draw and eject speed

Due to the push-through design of the dual-loop autosampler the sample draw and eject speed influence the recovery. Increasing the draw speed has only a minor effect, however the influence of the eject speed has a much higher impact, as shown in Figure 2.

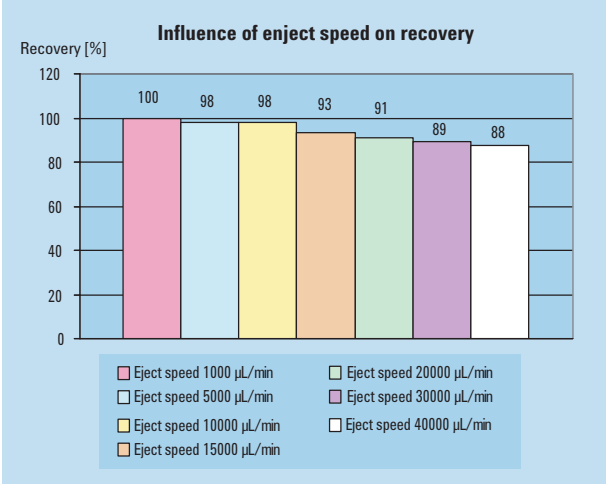

Figure 2 Influence of eject speed on recovery (draw speed 20000 µL/min)

- For best recovery results the sample draw speed should not exceed 20000 µL/min.
- Lower eject speeds yield better recoveries. The default eject speed is 10000 µL/min, however, for best recovery results this value should be lowered further.
- Highly viscous rinse solvents like DMSO, for example, yield lower recoveries even with low eject speeds. Therefore, we recommend using a mixture of DMSO/acetonitrile 50:50 v/v instead.

Sample loop fill factor for partial loop fill

Figure 3 shows the result of several injections with various injection volumes using the same sample loop (1000 µL). The peak area increases linearly until the loop is filled approximately up to 50 % (fill factor 0.5), which is represented by the red line. This means that in order to maximize the sample recovery the maximum injection volume should not exceed 50 % of the sample loop volume.

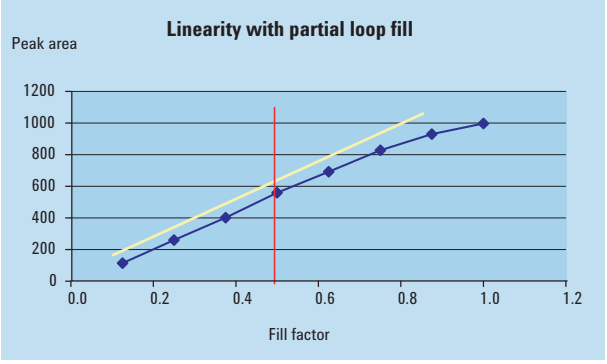

Figure 3 Linearity of peak area for partial loop fill

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